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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/623,679	07/22/2003	Koji Nozaki	030891	5083

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EXAMINER

WALKE, AMANDA C

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/623,679	Applicant(s) NOZAKI ET AL.	
	Examiner Amanda C Walke	Art Unit 1752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23-28 is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-8, and 14-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuda et al (JP 2001-033984 in view of its English language translation).

Yasuda et al disclose a negative resist material to be coated onto a substrate, exposed, then developed to form a pattern. The resist comprises a resin (novolac, polyvinyl ether, polyvinyl acetal, etc.) meeting the instant claim limitations, a crosslinking agent (preferably melamine), an organic solvent meeting the instant claim limitations, and optionally a surfactant ([0036], [0048]). The solvent may be anionic, cationic, nonionic, amphoteric, ethyleneoxide, fatty acid amides, fatty acid esters, quaternary ammonium salts, and/ or betaine. The process of forming a pattern includes employing a photomask and developing the resist optionally with pure water ([0037], [0041], [0086]).

Given the teachings of the reference, it would have been obvious to one of ordinary skill in the art to prepare the material of Yasuda et al choosing to add any of the disclosed surfactants with reasonable expectation of achieving a material able to form an accurate fine pattern.

3. Claims 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuda et al in view of Sato et al (5,955,241).

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Yasuda et al has been discussed above, but fails to teach or suggest the addition of a water soluble aromatic compound.

Sato et al disclose a chemical-amplification-type negative resist composition and a method for forming a negative resist pattern using the same. The chemical-amplification-type negative resist composition comprises an alkali-soluble resin, an acid-generating agent, and a compound capable of causing crosslinking reaction in the presence of an acid.

The reference further teaches “ Additionally, the chemical-amplification-type negative resist composition of the present invention may further contain a light-absorbing ingredient. Examples of compounds which can be used as the light-absorbing ingredient include naphthoquinone-1,2-diazide-5-sulfonic esters of polyphenols such as 1-[1-(4-hydroxyphenyl)isopropyl]-4-[1,1-bis(4-hydroxyphenyl)ethyl]benzene and bis(4-hydroxy-3,5-dimethylphenyl)-3,4-dihydroxyphenylmethane; benzophenone; 2,2',4,4'-tetrahydroxybenzophenone; 2,3,3',4,4',5'-hexahydroxybenzophenone; 4-dimethylamino-2',4'-dihydroxybenzophenone; 5-amino-3-methyl-1-phenyl-4-(4-hydroxyphenylazo)pyrazole; 4-dimethylamino-4'-hydroxyazobenzene; 4-diethylamino-4'-ethoxyazobenzene; 4-diethylaminoazobenzene; and curcumine.

The addition of such a light-absorbing ingredient is effective in improvement of sensitivity and definition, and the resulting resist pattern does not exhibit a wavy sectional shape but exhibits a suitable rectangular sectional shape. “

Given the teachings of Sato et al, it would have been obvious to one of ordinary skill in the art to prepare the material of Yasuda et al choosing to add a light absorbing compound of

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Sato et al to achieve an increase in the sensitivity of the material, with reasonable expectation of achieving a material able to form an accurate fine pattern.

Allowable Subject Matter

4. The following is a statement of reasons for the indication of allowable subject matter: Claims 23-28 are indicated as containing allowable subject matter. The Yasuda reference (prior art of record), fails to teach or suggest to one of ordinary skill in the art to prepare a pattern by employing a layer of resist and coating a second layer (resist thickening layer) as claimed.

Response to Arguments

5. Applicant's arguments filed 11/3/2004 have been fully considered but they are not persuasive.

Applicant has argued that the invention disclosed by Yasuda et al. is generally directed to a method wherein an organic layer is formed on a negative resist patterns, and then the organic layer on the resist pattern is developed by an alkali developer to thereby reduce the size of the resist pattern. Thus, the effect of the material of Yasuda et al. is opposed to that of the present invention. In the present invention, the material of the claim 1 is formed on a resist material layer to thicken the resist material. Also, an organic film of Yasuda et al. is formed on a negative resist pattern (claim 1), but the composition for the organic film does not include any crosslinking agent, which is different from the material of the present invention. This means that the invention of Yasuda et al. is not a resist pattern thickening material. Please note that melamine' as a crosslinking agent is disclosed by Yasuda et al, but it is included in the resist material, not in the

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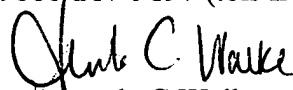
organic film. See paragraphs (0036) and (0048j). The organic film of Yasuda et al. is heated and the base diffuses from the organic film to the first negative resist pattern, solubilizing the first negative resist patterns into an exfoliation liquid, as disclosed in paragraph (00432). Therefore, any crosslinking agent should not be included in the organic film of Yasuda et al. The examiner points out that the claims are drawn to a material comprising a resin, a crosslinking agent, and at least one of a cationic surfactant, an amphoteric surfactant, and a non-ionic surfactant selected from an alkoxylate surfactant, a fatty acid ester surfactant, an amide surfactant, an alcohol surfactant, and an ethylene diamine surfactant. As admitted by applicant, the negative resist material of Yasuda does comprise the claimed components for the thickening material, thus it is the position of the examiner that this layer is taught and would function in a similar manner to the instantly claimed material.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amanda C Walke whose telephone number is 571-272-1337. The examiner can normally be reached on M-R 5:30-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866/217-9197 (toll-free).



Amanda C Walke
Examiner
Art Unit 1752

ACW

January 24, 2005